

Serial No. 10/720,386

Amendment Dated: November 1, 2006

Reply to Office Action of August 1, 2006

Docket No. HI-0176

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A slim-type optical pick-up actuator comprising:
 - a lens holder having an object lens for condensing a light on an optical disc, mounted at one side thereof, wherein the lens holder is configured to move in focusing and tracking directions;
 - a base having a plurality of first support members, each having a magnet attached thereto, wherein the magnets face each other; and
 - a driving member having a focusing coil and at least one tracking coil directly attached to the focusing coil in series in the tracking direction, a mass center position of the lens holder being substantially coincident with a force center position of the driving member;
 - wherein the lens holder comprises a second support member extending therefrom configured to support the driving member between the magnets, and
 - wherein the driving member activates the lens holder by an electromagnetic force with the magnets in focusing and tracking directions.

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2. (Original) The slim-type optical pick-up actuator of claim 1, wherein the second support member is integrally formed with the lens holder.
3. (Original) The slim-type optical pick-up actuator of claim 1, wherein the focusing coil is installed to face a central portion of the magnets, and two tracking coils are installed to respectively face left and right sides of the magnets.
4. (Original) The slim-type optical pick-up actuator of claim 1, wherein the second support member has a focusing coil support boss formed at a position facing with a central portion of the magnet to dispose a horizontally wound focusing coil, and the lens holder has a coil seat groove formed at both sides of the focusing coil support boss to dispose a vertically wound tracking coil.
5. (Original) The slim-type optical pick-up actuator of claim 1, wherein the focusing coil is installed to respectively face at least one of the left and right sides of the magnets, and two tracking coils are installed to respectively face the central portion of each of the magnets.
6. (Original) The slim-type optical pick-up actuator of claim 1, wherein the second support member has first and second tracking coil support bosses respectively facing central

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portions of each of the magnets that each support one vertically wound tracking coil, and wherein the second support member has focusing coil support bosses respectively facing with left and right sides of the magnets that each support one horizontally wound focusing coil.

7. (Original) The slim-type optical pick-up actuator of claim 1, wherein the second support member has at least one coil support boss facing with the central portion of the magnet to support one of a wound focusing coil and tracking coil, and has a coil seat portion formed at sides of the coil support boss to support the other wound coil, and wherein each of the magnets has a single polarity.

8. (Original) The slim-type optical pick-up actuator of claim 7, wherein the coil support boss supports a horizontally wound focusing coil and the coil seat portion is a groove to support a vertically wound tracking coil.

9. (Original) The slim-type optical pick-up actuator of claim 7, wherein the coil support boss supports a vertically wound tracking coil and the coil seat portion is a groove to support the horizontally wound focusing coil.

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10. (Original) The slim-type optical pick-up actuator of claim 1, wherein the focusing coil and the tracking coil disposed on the second support member are fixed by epoxy.

11. (Currently Amended) An optical pick-up actuator comprising:
a base that includes a magnetic support unit having a plurality of magnets facing each other;
a lens holder configured to be driven in tracking and focusing directions that includes an object lens mounted at a first side portion thereof and a magnetic driving unit mounted at a second side portion thereof positioned between the magnets,
wherein the lens holder comprises a second support member extending therefrom configured to a support the driving member between magnets, and
wherein a mass center position of the lens holder is substantially coincident with a force center position of the magnetic driving unit.

12. (Original) The actuator of claim 11, wherein the magnetic driving unit comprises coils wound in directions different from one another and fixedly attached together.

13. (Original) The actuator of claim 12, wherein the coils of the magnetic driving unit comprises:

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a focusing coil configured to face a central portion of the plurality of magnets and being horizontally wound in a rectangular shape; and

first and second tracking coils configured to face left and right sides of the magnets and directly attached to a lateral surface of the focusing coil.

14. (Original) The actuator of claim 12, wherein the coils of the magnetic driving unit comprises:

a tracking coil vertically wound to have a rectangular type facing with the central portion of the magnets; and

first and second focusing coils facing with the left and right sides of the magnets and directly attached to a lateral surface of the tracking coil.

15. (Original) The actuator of claim 11, wherein the magnet of the magnetic support unit has a single polarity.

16. (Original) The actuator of claim 11, wherein the force center position of the magnetic driving unit includes a force center position of the focusing coil and a force center position of the tracking coil that are each substantially coincident with the mass center position of the lens holder.

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17. (Original) The actuator of claim 11, comprising a pair of wire suspensions connected at a first end to the lens holder and at a second end to a frame to support the lens holder with a prescribed degree of freedom.

18. (Currently Amended) A slim-type optical pick-up actuator, comprising:
single magnets fixed to face one another having a magnetic field area therebetween;

a lens holder having an object lens mounted at one side thereof for activation, and having tracking and focusing coils symmetrically installed directly connected to each other in series in the tracking direction in the magnetic field area of the magnets;

a frame for supporting the lens holder; and

a plurality of wire suspensions for flexibly attaching the frame to the lens holder.

19. (Original) The slim-type optical pick-up actuator of claim 18, wherein the lens holder comprises:

first and second housing grooves each having one single magnet positioned therein; and

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a coil supporter integrally formed with the lens holder and formed in a Y-axis direction such that the focusing and tracking coils are seated between the first and second housing grooves.

20. (Original) The slim-type optical pick-up actuator of claim 19, wherein the coils comprises:

a focusing coil positioned at a central portion between the magnets and having a horizontally wound surface facing the magnets; and
left/right-side tracking coils positioned at left/right sides of the magnets and having a vertically wound surface facing two of the magnets.

21. (Original) The slim-type optical pick-up actuator of claim 20, wherein the coil supporter has a focusing coil support boss having the focusing coil fixed thereto, and has a tracking coil seat groove at a lower level between the focusing coil support boss and an internal lateral surface of the lens holder.

22. (Original) The slim-type optical pick-up actuator of claim 19, wherein the focusing coil is disposed at left and right sides of the coil supporter to face left and right sides of

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the magnets, and the tracking coil is disposed vertically on a center of the coil supporter to face the center of the magnets.

23. (Currently Amended) A method of forming a optical pick-up actuator, comprising:

providing a lens holder having an actuation area therein;

winding focusing and tracking coils;

directly attaching at least one tracking coil to at least one focusing coil to form a driving unit extending along a tracking direction of the lens holder, a mass center position of the lens holder being substantially coincident with a force center position of the driving unit;

coupling an object lens to a first side of the lens holder;

coupling the driving unit to a second side of the lens holder; and

flexibly attaching the lens holder to a frame so that the driving unit is supported completely in the actuation area.

24. (New) The slim-type optical pick-up actuator of claim 1, wherein a bobbin for fixing the focusing coil or the tracking coil is not needed.

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25. (New) The actuator of claim 11, wherein a bobbin for fixing the focusing coil or the tracking coil is not needed.

26. (New) The slim-type optical pick-up actuator of claim 18, wherein a bobbin for fixing the focusing coil or the tracking coil is not needed.

27. (New) The method according to claim 23, wherein a bobbin for fixing the focusing coil or the tracking coil is not needed.